Title: Maximizing Stew's Retirement Plan

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Instructor: William "Ike" Eisenhauer

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Author(s): Aishwarya Joy

Donavon Nigg

Tejas Deshpande

Michael D. Smith

Priyanka Patil

Rushikesh Jirage

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1.0 Abstract

This is the study of a fictitious case study of someone who, at the age of 20, set his future worth to be 1.5 Million by the time he reached the age of 55. He really wasn't sure how to get there except to save as much as he could for the next 30 years. The plan involved real estate, 401Ks and IRA investments. Today this person is 6 years away from his 55th birthday so this study is looking at:

- How well he invested
- What was his current rate of return over the past 30 years
- Is his plan to retire at 55 is still possible.

What if scenarios are addressed, with a base annual salary of $120,000 per year (in 2017 dollars) after he stops working.

2.0 Introduction

A 49-year-old man named Stew, took an economic class back in 1990 when we was getting his undergraduates degree, and set a plan to retire when he turned 55 years old. Due to the fact that most retirement plans don't pay out until 62 at the earliest, Stew set the following goals to bridge the gap for the 7 years before he could draw his retirement savings.

1. Own 5 rental properties and have all of them paid off before he turned 55.
2. Have the current house he lives in paid off so he would not have any mortgage payments.
3. The rental income would generate 9K per month in rent (after taxes and insurance)
4. The 4 homes would be valued at 1 Million (average of $225,000 each)
5. His IRA's, 401Ks and other retirement plans would be worth $250,000.00

At age 20, Stew figured if he was worth 1.5 million (Assets listed above plus the house he lives in) at age 55 he could retire. This paper will answer the question if his plan in 1990 was a good plan or not, where he currently sits (Present Worth) financially with 6 years left before he turn 55. and what is the best retirement options for him, estimating his Future Worth in 6, 12 and 20 years.

Though the person is the case study is fictitious, this case study represents a common issue of 'Maximizing Time Value of Money' for the anticipated number of years. It demonstrates some common principles and concepts of Engineering Economics to estimate and predict future worth of the money which are currently in savings in terms of real estates or retirement benefits.

3.0 Background

The case study discussed in this project represents a man named Stew, who is planning to maximize the value of money he has invested in savings and different properties since he was 20.

Between 2002 and 2005 Stew refinanced 4 of the 6 homes and put them on a 15-year mortgage. He then purchased again in 2010 and 2016. He is currently ahead of his schedule and now owns 6 homes (5 rental properties), two are already paid off, two are scheduled to be paid off in the next few years, and he is doubling his payments on the last two homes to have them paid off in 7 years. He is married has

no children and his wife is the same age and has a retirement plan, 401K and IRA's as well.

1. His 6 houses show a conservative market values of 1.75M
2. IRA's show a savings value of $250,000.
3. 401ks between him and his wife show a balance of $500,000
4. Rental income today is pulling in $6,500 monthly, (which is all used to pay mortgage, insurance, taxes, maintenance and repairs) with one vacancy which is a Lake Havasu City Condo, purchased as a winter vacation home. This condo is sometimes rented to snowbirds during the winter at $1,000.00 per month.
5. Retirement from his employer. Draw at age 60 = $2,500 draw at age 70 = $4,500 monthly
6. Wife's Retirement. Draw at age 60 = $1,500 draw at age 70 = $3,500 monthly.
7. 401 Ks for him and wife. Early age of 62 = $1,000 late draw at age 70 = $2,000 monthly.
8. IRA's for him and his wife early age of 62 = $1,500, late age of 70 = $3,000 monthly.
9. SSA between him and his wife early age of 62 = 3,000 if wait until 70 = 5,500 monthly.
10. Based on his $1.savings plan in 1990, he was planning on living on $120k per year.

Stew, who manages all the real-estate himself no longer wants to own so much property and would like to sell one of the homes now. A renters, Bob, who has lived in one of his rental properties for the past 20 years and has never missed a payment would like to purchase the home, but Bob is unable to get a bank loan of $300,000 from the bank. Stew is thinking of selling the property to Bob on contract and carrying the loan for a 30 year payback. Is this a good option or should Stew just sell the home, take the money, pay the capital gains and pay off two houses that have remaining balances? Know that Stew is using his rental properties to help shelter him from taxes and gives him additional write offs at the end of the year. Paying off the properties while he is making good money and in a high tax bracket may not be the best option. Also if he waits until he is unemployed and not making any money (in the grey area, not working but not old enough to draw retirement savings) he will be in a lower tax bracket and not sure if this is the right time to sell. Selling the house on contract will be annual income reported to the IRS and paying taxes on it annually instead of one time capital gains, is this a good option?

4.0 Goal set in 1990

Was this plan set in motion 27 years ago to have $1.5 million in assets still good in today's present value of money? At age 24 Stew was able to purchase his first home with an original investment of $30,000. Looking at future value in order to reach his goal he would have needed to get a rate of return at 16.9% for 25 years to earn 1.5 Million. However, through the years the compounding interest and reinvesting equity back into real estate his present value is now at $2.5 Million. If we hold the 30,000 as his base investment this is showing a rate of return 19.4% for those 25 years. If Stew was only worth 1.5 million today he would be owning fewer houses and not as much savings in his 401K or IRA. He would retire at 55, still by selling one house and placing that money into an annuity in order to bridge that gap prior to income from Social Security.

5.0 Common Assumptions

To estimate Present worth and Future worth of Stew's money, we made few assumptions after doing in-

depth research about Loan Payments, Current Inflation Rate etc. Some common assumptions which closely equal to Facts in the Real Estate market are -

- Stew wants to retire at the age of 55.
- House E and F currently have mortgages.
- Stew does not want any money left when he and his wife die.
- Option 1 - Pulling money out of SC = 62 years
- Option 2 - Pulling money out of SC = 70 years
- Housing loan between 3.5 and 3.75 %
- Interest rate for IRA and 401 K is 4%, Net after inflation = 3%
- The money left over after expenses is put inside a savings account with an interest of 1%
- Properties values will continue to increase at a rate of 14%, 10%, and 3% as shown in section 7.0
- Lifestyle living while retired at 120K per year.
- 401k rate of return (5-8%)
- Current family Salary in Hand, at 108,500 annually.
- Inflation Rate = 1%

Stew's ongoing Expenditure Breakdown-

- Life insurance costs - $5,000 per year for $500k
- Medical Health care costs - $10k per year
- Long-term care insurance costs - $2k
- House insurance (fire, accident, theft, damage, renter) - $1700 for $400K house
- 8% property management fee (if he keeps the houses for rental income) ?
- $300k in mortgages on 2 houses (assume 4.5%) I believe he planned to pay these off before he retires, he can do this two different ways (I think we'll make a recommendation)
    1. doubling his payment for the next 7 year
    2. Sale one of the other houses and pay off all loans.

Hence, including all costs mentioned above, we estimate Stew's current lifestyle maintenance cost as $120,000.

Inflation rate to calculate lifestyle maintenance after the age of 55 = **1%**

6.0 Concepts from the course

6.1 Net Present Value

The Net Present Value, abbreviated simply as NPV, is one of the most important concepts in finance. Net present value (NPV) is defined as an investment measure that tells an investor whether the investment is achieving a target yield at a given initial investment. NPV also quantifies the adjustment to the initial investment needed to achieve the target yield assuming everything else remains the same. In short, the net present value is nothing but the summation of cash flows for each period in the holding period, discounted at the investor's required rate of return. [1]

6.2 Internal Rate of Return

The Internal Rate of Return (IRR) for an investment is the percentage rate earned on each dollar invested for each period it is invested. IRR term is also usually used for interest. IRR gives an investor the means to compare alternative investments based on their earnings. With IRR, we can calculate the actual return provided by this project's cash flows in each case, then compare that rate of return with our case's MARR rate (how much it mandates that investments return). If the IRR is higher, it's a worthwhile investment. [2]

6.3 Present Value

Present value (PV) is the current worth of a future sum of money or stream of cash flows given a specified rate of return. The worth of a future amount of money at specific point in time. If one expects an investment to result in a cash flow at a certain time in the future, calculating the cash flows present value will help Stew to decide whether the investment results in a real profit. Calculating the present value assumes that the investor knows both the future amount and the applicable interest rate or rate of return. [3]

6.4 Future Value

Present value is used in reference to future value and the comparison of present value with future value best illustrates the principle of time value of money and the need for charging or paying additional risk-based interest rates. Simply the money today is worth more than the same money tomorrow because the passage of time has financial value attached to it and rewards or costs are demanded for owning or using today's money. Future value can relate to future investment cash inflows from investing today's money or future payment outflows from borrowing today's money. [4]

6.5 Rate of Return

The profit on an investment, normally expressed as an annual percentage. This is typically the ratio of the income from the investment over the cost of the investment. The rate of return is the amount Stew will receive after the cost of an initial investment, calculated in the form of a percentage. The percentage can be reflected as a positive, which is considered a gain or profit. When the percentage is negative, it reflects a loss. This information is very useful in determining whether the initial investment Stew made was a better than just keeping his money in a bank. Calculating the rate of return provides important information to him that can be used for future investments. [5]

7.0 Baseline Values

To estimate Future Worth of Stew's Money till the age of 85, we calculated his current income considering income from all rental properties and current salary. To calculate Present worth after all taxes and expenses, we have taken into consideration all his expenses on all rental properties, Maintenance and Operational expenses, Taxes and Insurance, association fees for all rental properties and his current lifestyle maintenance spending $120,000 including other expenses incurred to live

comfortably.

Most of his houses are in Washington State, and one in Arizona. To estimate Taxes and Insurance on these houses, we took help of Tax calculator for particular state.

Facts about all rental properties:

- **House A** - Lake Havasu, AZ Condo Est value 125K (vacation home rent only if needed.)
    - Estimated annual taxes 800.00 per year
    - Estimate rental income per month. 1,000.00
    - Estimated homeowners insurance 300.00 per year
    - Condo has association fees of $2,400.00 per year
    - Historic Rate of property appreciation is 14%

- **House B** - Clark county Wa - Est Value 550K (Current residence)
    - Estimated annual taxes $5,250.00
    - Estimate rental income per month. 0 this is Stew's Residence
    - Estimated homeowners insurance $800.00
    - Historic Rate of property appreciation is 10.6%
- **House C** - Cowlitz County WA Est. 125K
    - Estimated annual taxes $1,200
    - Estimate rental income per month. $1,200.00
    - Estimated homeowners insurance $325.00
    - Historic Rate of property appreciation is 10.6%
- **House D** - Clark County, WA - Est Value 300k
    - Estimated annual taxes-$3,100
    - Estimate rental income per month- $2,200
    - Estimated homeowners insurance-$780
    - Historic Rate of property appreciation is 10.6%
- **House E** - Clark County WA - Est Value 300K
    - Estimated annual taxes-$3,100
    - estimate rental income per month-$2,200
    - Estimated homeowners insurance-$780
    - Historic Rate of property appreciation is 10.6%
- **House F** - Clark County - Est Value 350K
    - Estimated annual taxes-3100
    - estimate rental income 1% of value per month-$3000
    - Estimated homeowners insurance= 780
    - National appreciation rate is 4.9% in last 12 months
    - Historic Rate of property appreciation is 10.6%

Inflation rate to calculate FV of houses and rental income = **1%**

7.1 Living style at age 49

Currently Stew already has a continuous income of $108,500 in hand per year in terms of Salary till the age of 55 (assuming he wants to retire at the age of 55). Though, he has all his properties providing

rental income per month, he still must pay mortgages on house E & F. He will have both houses paid off by age 55. Hence, at the age of 55, all rental properties will be paid off. Also, to estimate his current income, we have to consider all his expenses, including Loan payments, operational and maintenance expenses on all his properties, his lifestyle maintenance and insurance and other expenses he has to pay annually.

After calculating all above expenses and income, we estimated his current income from houses at the age of 49 as shown in Table below.

House	Current market value	Taxes	Insurance	Association fee	Maintenance	Loan Payment	Rental income	Net income(from houses)	Net income(from houses without loan payment)
House A (Vacation Home)	$125,000	-$800	-$300	-$2,400	-$2,500	$0	$12,000	$6,000	$6,000
House B (Home)	$550,000	-$5,250	-$800	$0	-$2,500	$0	$0	-$8,550	-$8,550
House C	$125,000	-$1,200	-$325	$0	-$3,000	$0	$14,400	$9,875	$9,875
House D	$300,000	-$3,100	-$780	$0	-$2,500	$0	$26,400	$20,020	$20,020
House E	$300,000	-$3,100	-$780	$0	-$2,000	-$27,840	$26,400	-$7,320	$20,520
House F	$350,000	-$3,100	-$780	$0	-$1,500	-$31,560	$36,000	-$940	$30,620
TOTAL							**$115,200**	**$19,085**	**$78,485**

Table-1: Rental Income

After estimating annual net income from all houses, we calculated his current net income, taking into consideration his salary and annual Lifestyle Maintenance cost.

Age	Income		Expense	Cash flow
	Rental income	Salary (In hand)	Lifestyle Maintenance in 2017 dollars	
49-55	$19,085	$108,500	-$120,000	$7,585

Table-2: Cash flow before age 55

7.2 FW at age 55

To calculate Future Worth of Stew's Money, we assume that he is going to reinvest this money $7,585 in

a Bank at the rate of 1% for 7 years. For the sake of calculating minimum possible Future worth, we considered a minimum possible Interest Rate.

Rate (Saving account at the bank)	1%
Nper	7
PMT	$7,585
FV	**$54,715**

Table 3: Money saved from excess rental income by age 55

Hence, when Stew will retire, he will have $54,715 in his Bank account.

8.0 Option of Selling House-D to Bob

There is always a valid option for Stew, to sell his House-D of value $300,000 to Bob, Stew's current Tenant, on Contract over 30 years with the rate of 3.5%. Hence, we consider this option by estimating, what is the benefit of selling House-D valued at $300,000 on contract at 3.5% over 30 Years, or should Stew ask Bob to pay higher rate than 5% since Bob is not able to borrow the money from the bank. Knowing that Bob is currently paying 2,000.00 per month rent, we estimated whether is this a good idea.

Factors to consider, Stew is currently paying property taxes, insurance and O&M that 2,000.00 per month payment. Approx monthly payment down to 1,500.00 over 30 years gain a net income of $575,00, but Stew then is no longer pay taxes, insurance, O&M and Stew also avoids paying real estate commissions, capital gains or places him in a higher tax bracket.

But, if Stew sells his House to Bob, instead of continuing to rent it, he gets following annual benefits assuming House-D is sold at the maximum $300,000 with the rate 3.5% over 30 years.

House	Value	Rate	Period in years	Annual benefits
D	300,000	3.50%	30	-$16,311.40

Table 4: Selling house D to Bob

But, if Stew continues to rent the same house to Bob, he gets the annual benefit of $20,020.

Conclusion of this situation:

As, Stew is earning a higher income by renting House D than selling it on contract. We conclude that Selling House D to Bob is a bad plan. In order to make this profitable for Stew, the interest rate would need to be greater than 5.5% which is not the option mentioned in the case study.

9.0 Drawing Benefits in future years of 12 & 20 (age 62 & 70)

As per the options mentioned in the case study, Stew can draw his money at the age of 62 or at the age of 70. Hence, to estimate the profitability of both these options, we calculated Stew's income at the age 85 assuming he draws all benefits at the age of 62 as well as 70.

9.1 Option 1 - Drawing Retirement Benefits at the age of 62

If he draws all benefits at the age of 62, he is able to draw following amounts per month-

- 401 Ks for him and his wife. Early age of 62 = $1,000.00
- IRA's for him and his wife early age of 62 = $1,500.00
- SSA between him and his wife early age of 62 = 3,000.00

Hence, to continue with calculation of Baseline costs till the age of 85 assuming that Stew will draw his Benefits at the age of 62, we added all income and expenses and estimated the total amount he saves after all deductions. We assume that he doesn't sell any house yet.

But, until he draws all his benefits at the age of 62, if he doesn't sell any of the houses he will not be able to survive on his rental income till the age of 62 as he is having expenses more than income. This is because he will not have salary after the age of 55, and only rental income is not sufficient to maintain his lifestyle of 120,000 and pay all the expenses on his properties.

We can analyze this in Appendix B.

Cash flows till the age of 62 are still negative with no house sold, as shown in Table below.

Age	Year	Annuity Income	Income from Property	Lifestyle Maintenance	IRA	401K	Retirement early draw	SSA	Cash flows
55.00	0.00	-54,714.66	0.00						-54,714.66
56.00	1.00	10,268.20	78,485.00	-120,000.00	0.00	0.00	0.00	0.00	-31,246.80
57.00	2.00	10,268.20	79,269.85	-121,200.00	0.00	0.00	0.00	0.00	-31,661.95
58.00	3.00	10,268.20	80,062.55	-122,412.00	0.00	0.00	0.00	0.00	-32,081.25
59.00	4.00	10,268.20	80,863.17	-123,636.12	0.00	0.00	0.00	0.00	-32,504.74
60.00	5.00	10,268.20	81,671.81	-124,872.48	0.00	0.00	0.00	0.00	-32,932.47
61.00	6.00	10,268.20	82,488.52	-126,121.21	0.00	0.00	0.00	0.00	-33,364.48

Table 5: Cash flow Age 55 thru 62 without selling properties

9.2 Option 2 - Drawing Retirement Benefits at the age of 62, Selling "House F" at 55.

Hence, considering this situation of having no income in hand till the age of 62, we estimated the income he can receive if he sells one house. We chose House F, depending on the market value and rent analysis shown in Appendix A.

While calculating his income after he sells house F, we deducted the rental income he was getting from that house and added Annual benefit is will be getting after selling it at the market value mentioned in Appendix A.

While estimating the amount of benefit after any House is sold, we consider following Facts-

Costs for selling a house are:

- 7% for the realtor
- 10% capital gains on difference between purchase price and sale price
- 33% income tax (although this could go up to 39.3%)

Hence, after selling House F, he gets enough money to satisfy all his expenses and still maintain the lifestyle of 120K per year as shown below.

Please refer to Appendix A for the estimated income from selling houses.

Age	Annuity Income	Income from Property	Lifestyle Maintenance	IRA	401K	Retirement early draw	SSA	Cash flows
55	-$54,715							-$54,715
56	$10,268	$114,922	-$120,000	$0	$0	$0	$0	$5,190
57	$10,268	$115,401	-$121,200	$0	$0	$0	$0	$4,469
58	$10,268	$115,884	-$122,412	$0	$0	$0	$0	$3,740
59	$10,268	$116,372	-$123,636	$0	$0	$0	$0	$3,004
60	$10,268	$116,866	-$124,872	$0	$0	$0	$0	$2,261
61	$10,268	$117,364	-$126,121	$0	$0	$0	$0	$1,511
62	$0	$117,867	-$127,382	$12,000	$18,000	$48,000	$36,000	$104,484

Table 6: Cash flow with selling House F at age 55

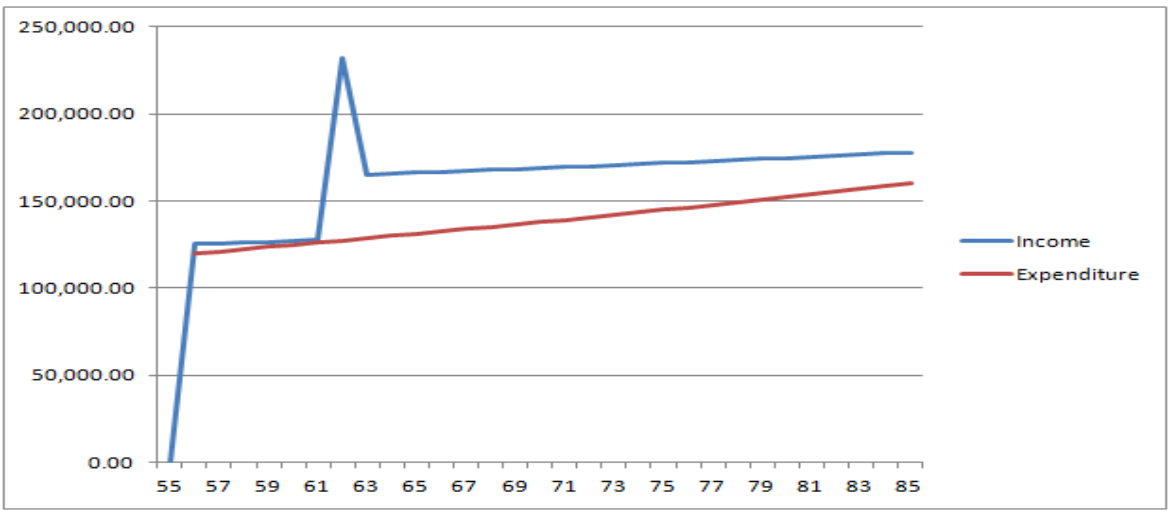

Figure 1: Income-Expenditure graph for option 2

9.3 Option 3 - Drawing Retirement Benefits at the age of 70, Selling "House F" at 55.

As per the case study, if Stew draws all his and his wife's retirement benefits at the age of 70, he will not be able to maintain his current lifestyle after retirement, as his expenditure crosses his income as shown in Table below, till the age of 70.

Assumption-

House F is already sold at the age of 55, as mentioned above. (If Option 1 isn't viable, then Drawing Retirement Benefits at the age of 70 without selling a house will also not be viable)

Age	Year	Annuity Income	Income from Property	Lifestyle Maintenance	IRA	401K	Retirement early draw	SSA	Cash flows
55	0	-$54,715							**-$54,715**
56	1	$5,010	$114,922	-$120,000	$0	$0	$0	$0	**-$68**
57	2	$5,010	$115,401	-$121,200	$0	$0	$0	$0	**-$789**
58	3	$5,010	$115,884	-$122,412	$0	$0	$0	$0	**-$1,518**
59	4	$5,010	$116,372	-$123,636	$0	$0	$0	$0	**-$2,253**
60	5	$5,010	$116,866	-$124,872	$0	$0	$0	$0	**-$2,997**
61	6	$5,010	$117,364	-$126,121	$0	$0	$0	$0	**-$3,747**
62	7	$5,010	$117,867	-$127,382	$0	$0	$0	$0	**-$4,505**
63	8	$5,010	$51,318	-$128,656	$0	$0	$0	$0	**-$72,328**

64	9	$5,010	$51,831	-$129,943	$0	$0	$0	$0	**-$73,102**
65	10	$5,010	$52,349	-$131,242	$0	$0	$0	$0	**-$73,883**
66	11	$5,010	$52,873	-$132,555	$0	$0	$0	$0	**-$74,672**
67	12	$5,010	$53,401	-$133,880	$0	$0	$0	$0	**-$75,468**
68	13	$5,010	$53,935	-$135,219	$0	$0	$0	$0	**-$76,273**
69	14	$5,010	$54,475	-$136,571	$0	$0	$0	$0	**-$77,086**

Table: Cash flow without taking retirement funds until age 70

As shown in Table above, he doesn't have enough money to maintain his preferred lifestyle till the age of 69. Though he can draw higher benefits if he waits to the age of 70, surviving till the age 70 becomes difficult. Amounts he will receive after drawing all benefits at the age 70 are shown in Appendix D.

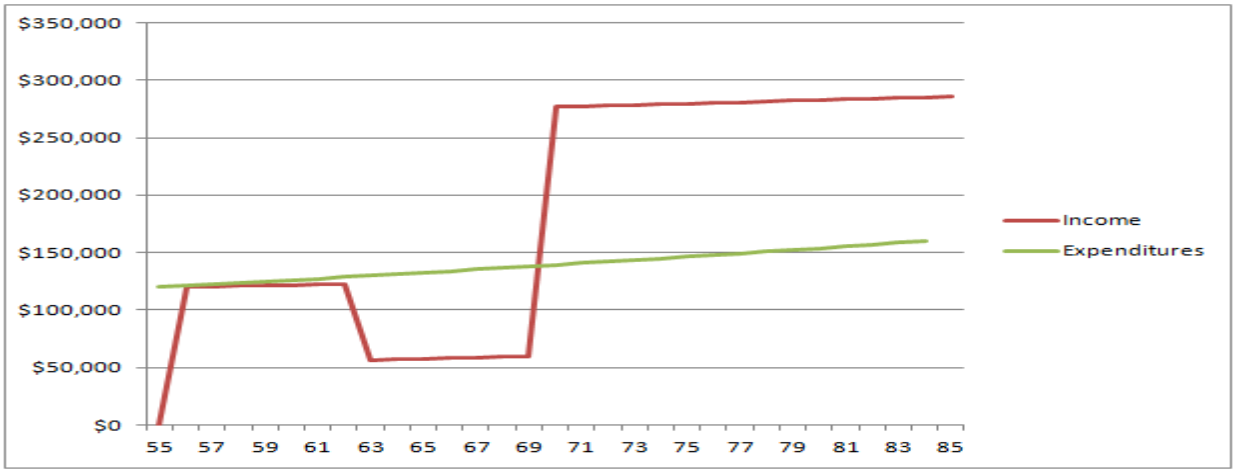

Figure 2: Income-Expenditure graph for option 3

10.0 What If Analysis

Retirement plans can be severely derailed if there are sudden unplanned expenses.

We have considered the following What If cases;

1. What if Stew has Legal Costs at the age of 60
2. What if Stew has Medical Expenses between the ages of 59-63.
3. What if SSA goes away?
4. What if there is a high rate of Inflation.

Note: All the What If Cases are analyzed on the recommendation that Stew retires at age 55, Sells house F at 55 and draws benefits from the age of 62.

Part of the "What If Analysis" is whether to supplement income by selling houses.

To counter income shortfall we propose selling off houses and putting the money into annuities. The reason to move money from the sale into annuities is to make the retirement funds less risky. With so much of the retirement based on high-risk real estate, it is wiser to move to annuities which although they have low return, they are also very low risk.

The choice of which houses to sell should be based on the ratio of (income per sale / rental income). Throughout the years, we cannot assume that these ratios will remain constant because the ratio of capital gains to net income differs over time. We should also sell off house B last, because Stew is living in that house. The ratios for the houses are shown in Appendix E, a sample is shown below:

House	Ratio of Income / Rental				
	Age 55	Age 62	Age 70	Age 77	Age 83
A	14.2	13.4	12,8	12.3	12
B	-42.1	-40	-38	-37	-36.4
C	10.4	8.1	7.7	7.5	7.3
D	11.9	9.4	9.0	8.7	8.5
E	11.6	9.2	8.8	8.5	8.3
F	9.0	7.2	6.9	6.6	6.5

Table 7: Ratio of Income from selling a house to income from renting that house

House B is negative, because it is not being rented out but taxes and fees are needed to live there.

From the table above and from Appendix E, it is clear that the houses should be sold in the following order: A, D, E, C, F, B

Although this is the best order for financial reasons, because House A is used by Stew as a vacation house, then House A should probably be sold just before house B unless there is a severe financial reason.

10.1 What If: Legal Costs at age 60.

If Stew incurs any legal assistance at the age of 60 which will cost him around $10,000. Cash flow given in Appendix J.

As his income at age 60 is only coming from the rental income and annuity so to manage this legal assistant cost which is around $8000, he has to cut the cost and reduce his lifestyle approximately 2 years so that he can compensate the extra amount.

Alternatively, he could withdraw from his IRA or 401k up to $75,000 with any real penalty. He will just need to pay his own funds back with interest to himself. This is a reasonable thing for him to do because in several years he has excess income above his $120k goal. On those years, he could be paying back the money borrowed from his IRA or 401k.

Conclusion: He has to cut costs and reduce his lifestyle for that year or borrow from his IRA or 401k.

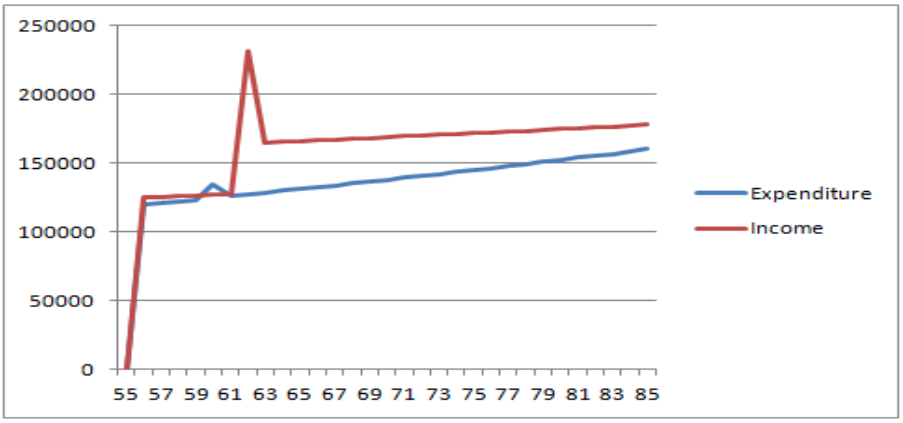

Figure 3: Income-Expenditure graph for what-if case 1

10.2 What If: Medical Costs between age 59-63.

If Stew incur medical emergency in between age 59-63 which will cost him $20,000 to $40,000 respectively?

If this emergency occurred, as stew don't have any income at age 59 to 61 he need to sell one house at the age of 59. So from all the 5 houses, he need to sell at least one house at age 59 and from the analysis he need to sell House A which has Market value of $204,000. After selling the house he should put all the money in the Annuity for 5 year period at 3.5% interest. Then from that he can withdraw $45,000 per year to spend on the medical emergency or any other emergency cost.

Cash flow given in Appendix K and L.

Conclusion: He has to sell at least one house and use that money for the emergency cost.

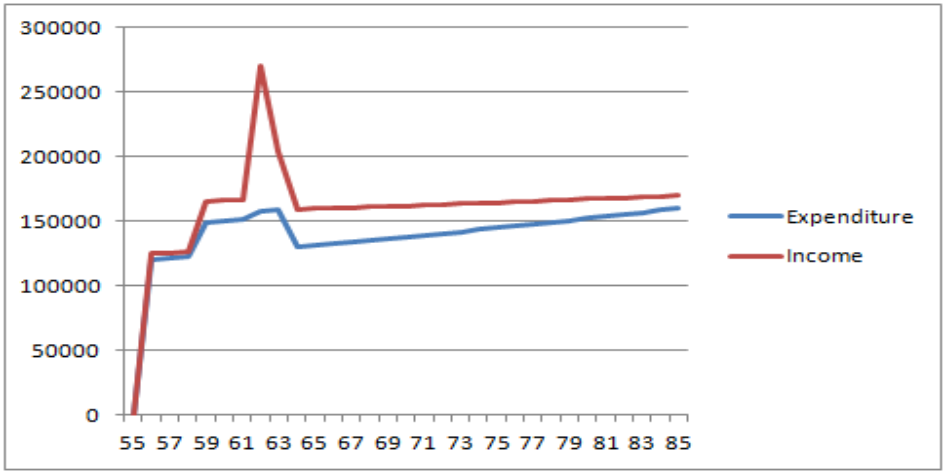

Figure 4: Income-Expenditure graph for what if case 2 (after recommendation)

10.3 What If: SSA goes away.

If Stew's Social Security Amount goes away because of government rules which results in loss of $36,000 per year.

If this condition happens he needs to change his lifestyle cost. Currently, his lifestyle cost at the age of 55 is $120,000 which now needs to be reduced by $15,000 so that he can save the money and control the loss of $36,000 per year.

(Here we are assuming that till age 56 the lifestyle cost is 120K and after that it is increasing 1% per year)

Cash flow given in Appendix H.

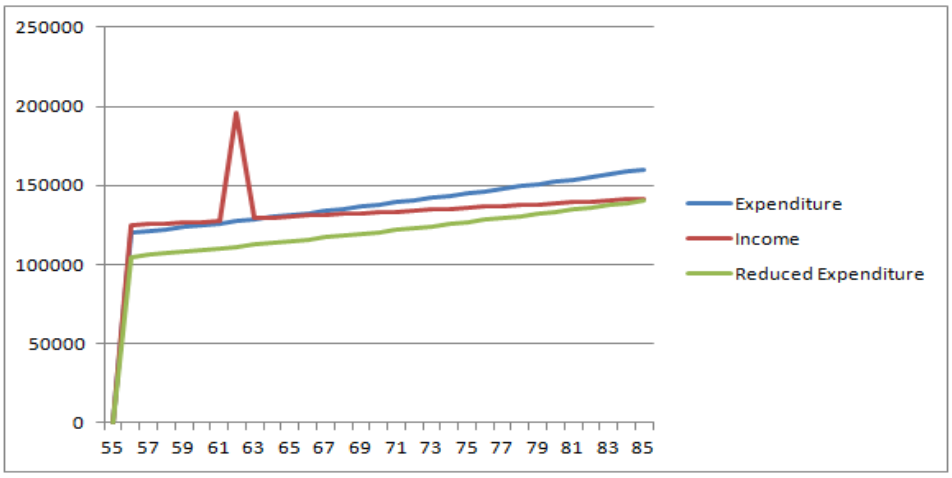

Figure 4: Income-Expenditure graph for what if case 3

10.4 What If: High Inflation versus all assets

Costs for the above analyses all assume that the inflation rate is 1%.

We will now look at the result of a higher inflation rate of 3%. Naturally if everything tracked with inflation, then there would be no need for further analysis. For example if inflation increased by 3% and we assumed that real estate, rental fees, the stock market, and SSA all increased at the same rate, then there would be no real effect except to possibly bump Stew up to a higher tax bracket. For purposes of this "What If" analysis, we are looking at a worse case scenario. To do this we are assuming that the inflation is 3% higher than all other increases from real estate, rental fees, stock market, and SSA.

There is clearly a severe deficit as the inflation increases the money needed to maintain the $120k per year lifestyle.

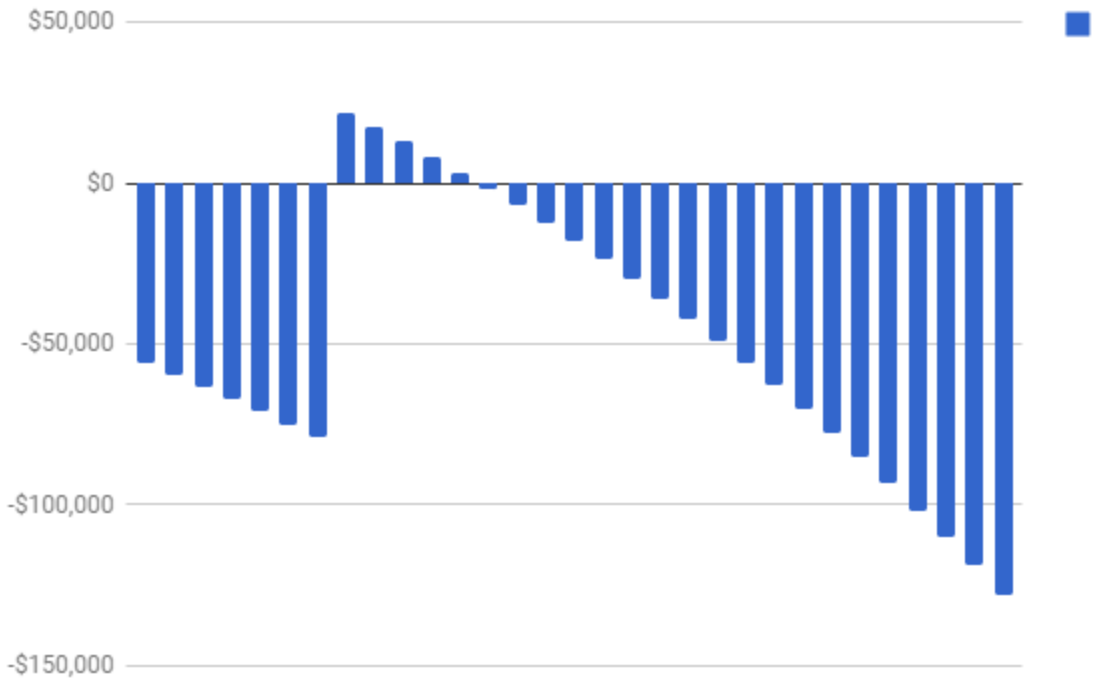

Figure 5: Cash Flow relative to our goal of $120k in 2017 dollars given 3% inflation (refer to Appendix F)

Due to the extreme case as shown in the chart above, we are going to sell every house in the order specified in Section 10.0

This results in a cash flow show below:

Figure 6: Cash flow relative to our goal of $120k in 2017 dollars with 3% inflation and selling houses (refer to Appendix G)

This is achieved by selling houses as shown

1. House A sold at 55
2. House D Sold at 59
3. Re-invest the excess $99k from the annuity at age 63
4. House E sold at 69
5. House C sold at 75
6. House F sold at 77
7. House B sold at 81

Although Stew will not have any house to live in at age 81, we assume that he can rent a place give the excess income from the annuity that ranges from $61k to $24k per year.

Conclusion: With careful selling of his houses, he can sustain his goal of $120k per year. The problem with this analysis is that Stew would need to sell off his vacation house (house A) first. In reality Stew would not know in advance what the future inflation rates would be and thus would more likely keep house A, which throws off this analysis.

11.0 Recommendation and Conclusion

It can be analyzed from the case that Stew has wisely invested in his savings since he started working in his early twenties. Investing in Real Estate is an attractive investment with a higher rate of return over other conservative investments and seems quite useful to him to lessen the impact of emergencies in the future.

Considering Stew is going to retire at the age of 55, he will have enough money to live comfortably and maintain his current lifestyle of 120K per year. But, whenever it comes to sudden emergencies and high cost 'What if Scenarios' discussed in the case, rental income will not be sufficient to satisfy all expenses and still maintain the lifestyle including expenses on those unanticipated emergencies. Hence, to maintain current lifestyle comfortably, we recommend to sell some of his houses whenever necessary, and draw his retirement savings (SSA, 401K and IRA's) at the earliest opportunity.

Throughout this report the team demonstrated multiple learning objectives for example. In week one economic decisions was analyzed and explained in this paper through the problem solving of early retirement, liquidating some assets to low risk annuities and when to sale real estate to avoid high cost scenarios. In week two cash flow interests was discussed and explained in this report through multiple spreadsheets analyzing multiple cash flows at different interest rates. In week three present and future worth was discussed and this reports looked at both these topics starting with an investment plan from 1990 through 2020, on into the future 6, 12, and 20 years. Rate of return analysis was calculated on an initial investment of 30K when Stew purchased his first house at age 23 plus investment in 401K and IRA's. also with the information on real estate the team was able to use replacement analysis and increasing cost of operations and maintenance fees when looking into the final resale values of the owned properties. Finally, the team used best alternative choices and maximizing the present value of money through what-if analysis, cost of selling properties, fees on commission rates, higher tax brackets and paying capital gains.

Appendix A- Net Income after taxes from Selling Houses

After Tax Value if Houses are sold at the indicated Age (It is assumed that Stew's tax bracket will mean giving up 50% of capital gains after paying for the selling fees)						
Original	$100,000	$300,000	$80,000	$175,000	$175,000	$200,000
Age / year	30/1998	35/2003	25/1993	33/2001	40/2008	43/2010
Age	House A	House B	House C	House D	House E	House F
49	$112,500	$425,000	$102,500	$237,500	$237,500	$275,000
55	$187,186	$637,179	$150,723	$353,234	$353,234	$410,023
56	$191,301	$651,795	$154,044	$361,206	$361,206	$419,324
57	$195,540	$666,848	$157,466	$369,417	$369,417	$428,904
58	$199,907	$682,354	$160,990	$377,875	$377,875	$438,771
59	$204,404	$698,325	$164,619	$386,586	$386,586	$448,934
60	$209,036	$714,774	$168,358	$395,559	$395,559	$459,402
61	$213,807	$731,718	$172,209	$404,800	$404,800	$470,184
62	$218,721	$749,169	$176,175	$414,319	$414,319	$481,289
63	$223,783	$767,144	$180,260	$424,124	$424,124	$492,728
64	$228,996	$785,658	$184,468	$434,223	$434,223	$504,510
65	$234,366	$804,728	$188,802	$444,624	$444,624	$516,645
66	$239,897	$824,370	$193,266	$455,338	$455,338	$529,145
67	$245,594	$844,601	$197,864	$466,373	$466,373	$542,019
68	$251,462	$865,439	$202,600	$477,740	$477,740	$555,279
69	$257,506	$886,902	$207,478	$489,447	$489,447	$568,938
70	$263,731	$909,009	$212,502	$501,505	$501,505	$583,006
71	$270,143	$931,780	$217,677	$513,925	$513,925	$597,496
72	$276,747	$955,233	$223,008	$526,718	$526,718	$612,421
73	$283,550	$979,390	$228,498	$539,895	$539,895	$627,794
74	$290,556	$1,004,272	$234,153	$553,466	$553,466	$643,628
75	$297,773	$1,029,900	$239,977	$567,445	$567,445	$659,936
76	$305,206	$1,056,297	$245,977	$581,844	$581,844	$676,734
77	$312,862	$1,083,486	$252,156	$596,674	$596,674	$694,036
78	$320,748	$1,111,490	$258,521	$611,949	$611,949	$711,858
79	$328,870	$1,140,335	$265,076	$627,683	$627,683	$730,213
80	$337,237	$1,170,045	$271,828	$643,888	$643,888	$749,120
81	$345,854	$1,200,647	$278,783	$660,580	$660,580	$768,593
82	$354,729	$1,232,166	$285,947	$677,772	$677,772	$788,651
83	$363,871	$1,264,631	$293,325	$695,481	$695,481	$809,311
84	$373,287	$1,298,070	$300,925	$713,720	$713,720	$830,590
85	$382,986	$1,332,512	$308,753	$732,507	$732,507	$852,508
86	$392,975	$1,367,987	$316,815	$751,857	$751,857	$875,083
87	$403,265	$1,404,527	$325,120	$771,787	$771,787	$898,335
88	$413,863	$1,442,163	$333,673	$792,316	$792,316	$922,285
89	$424,779	$1,480,928	$342,484	$813,461	$813,461	$946,954
90	$436,022	$1,520,855	$351,558	$835,239	$835,239	$972,363

Appendix B- Stew draws benefits at the age of 62, estimation with 'No House Sold'

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement early draw	SSA	Cash flows
55.00	0.00	-54,714.66	0.00						-54,714.66
56.00	1.00	10,268.20	78,485.00	-120,000.00	0.00	0.00	0.00	0.00	-31,246.80
57.00	2.00	10,268.20	79,269.85	-121,200.00	0.00	0.00	0.00	0.00	-31,661.95
58.00	3.00	10,268.20	80,062.55	-122,412.00	0.00	0.00	0.00	0.00	-32,081.25
59.00	4.00	10,268.20	80,863.17	-123,636.12	0.00	0.00	0.00	0.00	-32,504.74
60.00	5.00	10,268.20	81,671.81	-124,872.48	0.00	0.00	0.00	0.00	-32,932.47
61.00	6.00	10,268.20	82,488.52	-126,121.21	0.00	0.00	0.00	0.00	-33,364.48
62.00	7.00	0.00	83,313.41	-127,382.42	12,000.00	18,000.00	48,000.00	36,000.00	69,930.99
63.00	8.00	0.00	84,146.54	-128,656.24	12,000.00	18,000.00	48,000.00	36,000.00	69,490.30
64.00	9.00	0.00	84,988.01	-129,942.80	12,000.00	18,000.00	48,000.00	36,000.00	69,045.20
65.00	10.00	0.00	85,837.89	-131,242.23	12,000.00	18,000.00	48,000.00	36,000.00	68,595.66
66.00	11.00	0.00	86,696.27	-132,554.66	12,000.00	18,000.00	48,000.00	36,000.00	68,141.61
67.00	12.00	0.00	87,563.23	-133,880.20	12,000.00	18,000.00	48,000.00	36,000.00	67,683.03
68.00	13.00	0.00	88,438.86	-135,219.00	12,000.00	18,000.00	48,000.00	36,000.00	67,219.86
69.00	14.00	0.00	89,323.25	-136,571.19	12,000.00	18,000.00	48,000.00	36,000.00	66,752.06
70.00	15.00	0.00	90,216.48	-137,936.91	12,000.00	18,000.00	48,000.00	36,000.00	66,279.58
71.00	16.00	0.00	91,118.65	-139,316.27	12,000.00	18,000.00	48,000.00	36,000.00	65,802.37
72.00	17.00	0.00	92,029.83	-140,709.44	12,000.00	18,000.00	48,000.00	36,000.00	65,320.40
73.00	18.00	0.00	92,950.13	-142,116.53	12,000.00	18,000.00	48,000.00	36,000.00	64,833.60
74.00	19.00	0.00	93,879.63	-143,537.70	12,000.00	18,000.00	48,000.00	36,000.00	64,341.94
75.00	20.00	0.00	94,818.43	-144,973.07	12,000.00	18,000.00	48,000.00	36,000.00	63,845.36
76.00	21.00	0.00	95,766.62	-146,422.80	12,000.00	18,000.00	48,000.00	36,000.00	63,343.81
77.00	22.00	0.00	96,724.28	-147,887.03	12,000.00	18,000.00	48,000.00	36,000.00	62,837.25
78.00	23.00	0.00	97,691.52	-149,365.90	12,000.00	18,000.00	48,000.00	36,000.00	62,325.62
79.00	24.00	0.00	98,668.44	-150,859.56	12,000.00	18,000.00	48,000.00	36,000.00	61,808.88
80.00	25.00	0.00	99,655.12	-152,368.16	12,000.00	18,000.00	48,000.00	36,000.00	61,286.97
81.00	26.00	0.00	100,651.68	-153,891.84	12,000.00	18,000.00	48,000.00	36,000.00	60,759.84
82.00	27.00	0.00	101,658.19	-155,430.76	12,000.00	18,000.00	48,000.00	36,000.00	60,227.43
83.00	28.00	0.00	102,674.77	-156,985.07	12,000.00	18,000.00	48,000.00	36,000.00	59,689.71
84.00	29.00	0.00	103,701.52	-158,554.92	12,000.00	18,000.00	48,000.00	36,000.00	59,146.61
85.00	30.00	0.00	104,738.54	-160,140.47	12,000.00	18,000.00	48,000.00	36,000.00	58,598.07

Appendix C- Stew draws benefits at the age of 62, estimation with 'House F Sold'

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement early draw	SSA	Cash flows
55	0	-$54,715							-$54,715
56	1	$10,268	$114,922	-$120,000	$0	$0	$0	$0	$5,190
57	2	$10,268	$115,401	-$121,200	$0	$0	$0	$0	$4,469
58	3	$10,268	$115,884	-$122,412	$0	$0	$0	$0	$3,740
59	4	$10,268	$116,372	-$123,636	$0	$0	$0	$0	$3,004
60	5	$10,268	$116,866	-$124,872	$0	$0	$0	$0	$2,261
61	6	$10,268	$117,364	-$126,121	$0	$0	$0	$0	$1,511
62	7	$0	$117,867	-$127,382	$12,000	$18,000	$48,000	$36,000	$104,484
63	8	$0	$51,318	-$128,656	$12,000	$18,000	$48,000	$36,000	$36,662
64	9	$0	$51,831	-$129,943	$12,000	$18,000	$48,000	$36,000	$35,888
65	10	$0	$52,349	-$131,242	$12,000	$18,000	$48,000	$36,000	$35,107
66	11	$0	$52,873	-$132,555	$12,000	$18,000	$48,000	$36,000	$34,318
67	12	$0	$53,401	-$133,880	$12,000	$18,000	$48,000	$36,000	$33,521
68	13	$0	$53,935	-$135,219	$12,000	$18,000	$48,000	$36,000	$32,716
69	14	$0	$54,475	-$136,571	$12,000	$18,000	$48,000	$36,000	$31,904
70	15	$0	$55,020	-$137,937	$12,000	$18,000	$48,000	$36,000	$31,083
71	16	$0	$55,570	-$139,316	$12,000	$18,000	$48,000	$36,000	$30,254
72	17	$0	$56,125	-$140,709	$12,000	$18,000	$48,000	$36,000	$29,416
73	18	$0	$56,687	-$142,117	$12,000	$18,000	$48,000	$36,000	$28,570
74	19	$0	$57,254	-$143,538	$12,000	$18,000	$48,000	$36,000	$27,716
75	20	$0	$57,826	-$144,973	$12,000	$18,000	$48,000	$36,000	$26,853
76	21	$0	$58,404	-$146,423	$12,000	$18,000	$48,000	$36,000	$25,982
77	22	$0	$58,988	-$147,887	$12,000	$18,000	$48,000	$36,000	$25,101
78	23	$0	$59,578	-$149,366	$12,000	$18,000	$48,000	$36,000	$24,212
79	24	$0	$60,174	-$150,860	$12,000	$18,000	$48,000	$36,000	$23,315
80	25	$0	$60,776	-$152,368	$12,000	$18,000	$48,000	$36,000	$22,408
81	26	$0	$61,384	-$153,892	$12,000	$18,000	$48,000	$36,000	$21,492
82	27	$0	$61,997	-$155,431	$12,000	$18,000	$48,000	$36,000	$20,567
83	28	$0	$62,617	-$156,985	$12,000	$18,000	$48,000	$36,000	$19,632
84	29	$0	$63,244	-$158,555	$12,000	$18,000	$48,000	$36,000	$18,689
85	30	$0	$63,876	-$160,140	$12,000	$18,000	$48,000	$36,000	$17,736

Appendix D- Stew draws benefits at the age of 70 (House F is sold)

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement early draw	SSA	Cash flows
55	0	-$54,715							-$54,715
56	1	$5,010	$114,922	-$120,000	$0	$0	$0	$0	-$68
57	2	$5,010	$115,401	-$121,200	$0	$0	$0	$0	-$789
58	3	$5,010	$115,884	-$122,412	$0	$0	$0	$0	-$1,518
59	4	$5,010	$116,372	-$123,636	$0	$0	$0	$0	-$2,253
60	5	$5,010	$116,866	-$124,872	$0	$0	$0	$0	-$2,997
61	6	$5,010	$117,364	-$126,121	$0	$0	$0	$0	-$3,747
62	7	$5,010	$117,867	-$127,382	$0	$0	$0	$0	-$4,505
63	8	$5,010	$51,318	-$128,656	$0	$0	$0	$0	-$72,328
64	9	$5,010	$51,831	-$129,943	$0	$0	$0	$0	-$73,102
65	10	$5,010	$52,349	-$131,242	$0	$0	$0	$0	-$73,883
66	11	$5,010	$52,873	-$132,555	$0	$0	$0	$0	-$74,672
67	12	$5,010	$53,401	-$133,880	$0	$0	$0	$0	-$75,468
68	13	$5,010	$53,935	-$135,219	$0	$0	$0	$0	-$76,273
69	14	$5,010	$54,475	-$136,571	$0	$0	$0	$0	-$77,086
70	15	$0	$55,020	-$137,937	$36,000	$24,000	$96,000	$66,000	$139,083
71	16	$0	$55,570	-$139,316	$36,000	$24,000	$96,000	$66,000	$138,254
72	17	$0	$56,125	-$140,709	$36,000	$24,000	$96,000	$66,000	$137,416
73	18	$0	$56,687	-$142,117	$36,000	$24,000	$96,000	$66,000	$136,570
74	19	$0	$57,254	-$143,538	$36,000	$24,000	$96,000	$66,000	$135,716
75	20	$0	$57,826	-$144,973	$36,000	$24,000	$96,000	$66,000	$134,853
76	21	$0	$58,404	-$146,423	$36,000	$24,000	$96,000	$66,000	$133,982
77	22	$0	$58,988	-$147,887	$36,000	$24,000	$96,000	$66,000	$133,101
78	23	$0	$59,578	-$149,366	$36,000	$24,000	$96,000	$66,000	$132,212
79	24	$0	$60,174	-$150,860	$36,000	$24,000	$96,000	$66,000	$131,315
80	25	$0	$60,776	-$152,368	$36,000	$24,000	$96,000	$66,000	$130,408
81	26	$0	$61,384	-$153,892	$36,000	$24,000	$96,000	$66,000	$129,492
82	27	$0	$61,997	-$155,431	$36,000	$24,000	$96,000	$66,000	$128,567
83	28	$0	$62,617	-$156,985	$36,000	$24,000	$96,000	$66,000	$127,632
84	29	$0	$63,244	-$158,555	$36,000	$24,000	$96,000	$66,000	$126,689
85	30	$0	$63,876	-$160,140	$36,000	$24,000	$96,000	$66,000	$125,736

Appendix E - Ratio of Income from selling a house to the yearly income from that house

House	A	B	C	D	E	F
Age	18.8	-49.7	10.4	11.9	11.6	9.0
49	14.2	-42.1	8.6	10.0	9.7	7.6
55	14.1	-41.8	8.5	9.9	9.6	7.5
56	14.0	-41.5	8.5	9.8	9.6	7.5
57	13.9	-41.2	8.4	9.8	9.5	7.4
58	13.8	-41.0	8.4	9.7	9.4	7.4
59	13.7	-40.7	8.3	9.6	9.4	7.3
60	13.6	-40.5	8.2	9.6	9.3	7.3
61	13.5	-40.2	8.2	9.5	9.3	7.2
62	13.4	-40.0	8.1	9.4	9.2	7.2
63	13.3	-39.8	8.1	9.4	9.2	7.1
64	13.2	-39.5	8.0	9.3	9.1	7.1
65	13.2	-39.3	8.0	9.3	9.0	7.0
66	13.1	-39.1	7.9	9.2	9.0	7.0
67	13.0	-38.9	7.9	9.2	8.9	7.0
68	12.9	-38.7	7.8	9.1	8.9	6.9
69	12.9	-38.5	7.8	9.1	8.9	6.9
70	12.8	-38.3	7.8	9.0	8.8	6.9
71	12.7	-38.2	7.7	9.0	8.8	6.8
72	12.6	-38.0	7.7	8.9	8.7	6.8
73	12.6	-37.8	7.6	8.9	8.7	6.8
74	12.5	-37.6	7.6	8.9	8.6	6.7
75	12.5	-37.5	7.6	8.8	8.6	6.7
76	12.4	-37.3	7.5	8.8	8.6	6.7
77	12.3	-37.2	7.5	8.7	8.5	6.6
78	12.3	-37.0	7.5	8.7	8.5	6.6
79	12.2	-36.9	7.4	8.7	8.5	6.6
80	12.2	-36.8	7.4	8.6	8.4	6.6
81	12.1	-36.6	7.4	8.6	8.4	6.5
82	12.1	-36.5	7.3	8.6	8.4	6.5
83	12.0	-36.4	7.3	8.5	8.3	6.5
84	12.0	-36.2	7.3	8.5	8.3	6.5
85	11.9	-36.1	7.2	8.5	8.3	6.5
86	11.9	-36.0	7.2	8.5	8.2	6.4

Appendix F - What if inflation beats all other assets by 3%

Age	Yr	Annuity Income	Income from Property	Lifestyle Maintenance	IRA	401K	Retirement early draw	SSA	Cash flows
55	0	$8,646	$78,485	-$143,286	$0	$0	$0	$0	-$56,156
56	1	$8,646	$79,270	-$147,585	$0	$0	$0	$0	-$59,669
57	2	$8,646	$80,063	-$152,012	$0	$0	$0	$0	-$63,304
58	3	$8,646	$80,863	-$156,573	$0	$0	$0	$0	-$67,064
59	4	$8,646	$81,672	-$161,270	$0	$0	$0	$0	-$70,952
60	5	$8,646	$82,489	-$166,108	$0	$0	$0	$0	-$74,974
61	6	$8,646	$83,313	-$171,091	$0	$0	$0	$0	-$79,132
62	7	$0	$84,147	-$176,224	$12,000	$18,000	$48,000	$36,000	$21,922
63	8	$0	$84,988	-$181,511	$12,000	$18,000	$48,000	$36,000	$17,477
64	9	$0	$85,838	-$186,956	$12,000	$18,000	$48,000	$36,000	$12,882
65	10	$0	$86,696	-$192,565	$12,000	$18,000	$48,000	$36,000	$8,131
66	11	$0	$87,563	-$198,342	$12,000	$18,000	$48,000	$36,000	$3,222
67	12	$0	$88,439	-$204,292	$12,000	$18,000	$48,000	$36,000	-$1,853
68	13	$0	$89,323	-$210,421	$12,000	$18,000	$48,000	$36,000	-$7,097
69	14	$0	$90,216	-$216,733	$12,000	$18,000	$48,000	$36,000	-$12,517
70	15	$0	$91,119	-$223,235	$12,000	$18,000	$48,000	$36,000	-$18,117
71	16	$0	$92,030	-$229,932	$12,000	$18,000	$48,000	$36,000	-$23,903
72	17	$0	$92,950	-$236,830	$12,000	$18,000	$48,000	$36,000	-$29,880
73	18	$0	$93,880	-$243,935	$12,000	$18,000	$48,000	$36,000	-$36,056
74	19	$0	$94,818	-$251,253	$12,000	$18,000	$48,000	$36,000	-$42,435
75	20	$0	$95,767	-$258,791	$12,000	$18,000	$48,000	$36,000	-$49,024
76	21	$0	$96,724	-$266,555	$12,000	$18,000	$48,000	$36,000	-$55,830
77	22	$0	$97,692	-$274,551	$12,000	$18,000	$48,000	$36,000	-$62,860
78	23	$0	$98,668	-$282,788	$12,000	$18,000	$48,000	$36,000	-$70,119
79	24	$0	$99,655	-$291,271	$12,000	$18,000	$48,000	$36,000	-$77,616
80	25	$0	$100,652	-$300,010	$12,000	$18,000	$48,000	$36,000	-$85,358
81	26	$0	$101,658	-$309,010	$12,000	$18,000	$48,000	$36,000	-$93,352
82	27	$0	$102,675	-$318,280	$12,000	$18,000	$48,000	$36,000	-$101,605
83	28	$0	$103,702	-$327,829	$12,000	$18,000	$48,000	$36,000	-$110,127
84	29	$0	$104,739	-$337,663	$12,000	$18,000	$48,000	$36,000	-$118,925
85	30	$0	$105,786	-$347,793	$12,000	$18,000	$48,000	$36,000	-$128,007

Appendix G - What if inflation beats all other assets by 3% and Stew sells houses over time

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement early draw	SSA	Income from Selling the house	Cash flows	
55	0	$8,646	$76,944	-$143,286					$49,238	-$8,458	
56	1	$8,646	$77,714	-$147,585	$0	$0	$0	$0	$49,238	-$11,987	House A sold at 55
57	2	$8,646	$78,491	-$152,012	$0	$0	$0	$0	$49,238	-$15,638	
58	3	$8,646	$79,276	-$156,573	$0	$0	$0	$0	$49,238	-$19,413	
59	4	$8,646	$57,954	-$161,270	$0	$0	$0	$0	$101,689	$7,019	
60	5	$8,646	$58,534	-$166,108	$0	$0	$0	$0	$101,689	$2,761	House D Sold at 59
61	6	$8,646	$59,119	-$171,091	$0	$0	$0	$0	$101,689	-$1,637	
62	7	$0	$59,710	-$176,224	$12,000	$18,000	$48,000	$36,000	$2,689	$175	
63	8	$0	$60,307	-$181,511	$12,000	$18,000	$48,000	$36,000	$21,185	$13,982	
64	9	$0	$60,910	-$186,956	$12,000	$18,000	$48,000	$36,000	$21,185	$9,139	Re-invest $99k into annuity
65	10	$0	$61,519	-$192,565	$12,000	$18,000	$48,000	$36,000	$21,185	$4,140	
66	11	$0	$62,135	-$198,342	$12,000	$18,000	$48,000	$36,000	$21,185	-$1,022	
67	12	$0	$62,756	-$204,292	$12,000	$18,000	$48,000	$36,000	$21,185	-$6,351	
68	13	$0	$38,593	-$210,421	$12,000	$18,000	$48,000	$36,000	$75,490	$17,662	
69	14	$0	$38,979	-$216,733	$12,000	$18,000	$48,000	$36,000	$75,490	$11,735	
70	15	$0	$39,369	-$223,235	$12,000	$18,000	$48,000	$36,000	$75,490	$5,623	
71	16	$0	$39,762	-$229,932	$12,000	$18,000	$48,000	$36,000	$75,490	-$680	House E sold at 69
72	17	$0	$40,160	-$236,830	$12,000	$18,000	$48,000	$36,000	$75,490	-$7,181	
73	18	$0	$40,562	-$243,935	$12,000	$18,000	$48,000	$36,000	$75,490	-$13,884	
74	19	$0	$40,967	-$251,253	$12,000	$18,000	$48,000	$36,000	$75,490	-$20,797	
75	20	$0	$28,586	-$258,791	$12,000	$18,000	$48,000	$36,000	$122,052	$5,848	House C sold at 75
76	21	$0	$28,872	-$266,555	$12,000	$18,000	$48,000	$36,000	$122,052	-$1,630	
77	22	$0	-$11,297	-$274,551	$12,000	$18,000	$48,000	$36,000	$182,563	$10,714	
78	23	$0	-$11,410	-$282,788	$12,000	$18,000	$48,000	$36,000	$182,563	$2,365	House F sold at 77
79	24	$0	-$11,524	-$291,271	$12,000	$18,000	$48,000	$36,000	$182,563	-$6,233	
80	25	$0	-$11,639	-$300,010	$12,000	$18,000	$48,000	$36,000	$182,563	-$15,086	
81	26	$0	$0	-$309,010	$12,000	$18,000	$48,000	$36,000	$256,928	$61,918	
82	27	$0	$0	-$318,280	$12,000	$18,000	$48,000	$36,000	$256,928	$52,648	
83	28	$0	$0	-$327,829	$12,000	$18,000	$48,000	$36,000	$256,928	$43,100	House B sold at 81
84	29	$0	$0	-$337,663	$12,000	$18,000	$48,000	$36,000	$256,928	$33,265	
85	30	$0	$0	-$347,793	$12,000	$18,000	$48,000	$36,000	$256,928	$23,135	

Appendix H - What if SSA is not available and Stew sells House F

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement draw	SSA	Cash flows
55	0	-$54,715							-$54,715
56	1	$10,268	$114,922	-$120,000	$0	$0	$0	$0	$5,190
57	2	$10,268	$115,401	-$121,200	$0	$0	$0	$0	$4,469
58	3	$10,268	$115,884	-$122,412	$0	$0	$0	$0	$3,740
59	4	$10,268	$116,372	-$123,636	$0	$0	$0	$0	$3,004
60	5	$10,268	$116,866	-$124,872	$0	$0	$0	$0	$2,261
61	6	$10,268	$117,364	-$126,121	$0	$0	$0	$0	$1,511
62	7	$0	$117,867	-$127,382	$12,000	$18,000	$48,000	$0	$68,484
63	8	$0	$51,318	-$128,656	$12,000	$18,000	$48,000	$0	$662
64	9	$0	$51,831	-$129,943	$12,000	$18,000	$48,000	$0	-$112
65	10	$0	$52,349	-$131,242	$12,000	$18,000	$48,000	$0	-$893
66	11	$0	$52,873	-$132,555	$12,000	$18,000	$48,000	$0	-$1,682
67	12	$0	$53,401	-$133,880	$12,000	$18,000	$48,000	$0	-$2,479
68	13	$0	$53,935	-$135,219	$12,000	$18,000	$48,000	$0	-$3,284
69	14	$0	$54,475	-$136,571	$12,000	$18,000	$48,000	$0	-$4,096
70	15	$0	$55,020	-$137,937	$12,000	$18,000	$48,000	$0	-$4,917
71	16	$0	$55,570	-$139,316	$12,000	$18,000	$48,000	$0	-$5,746
72	17	$0	$56,125	-$140,709	$12,000	$18,000	$48,000	$0	-$6,584
73	18	$0	$56,687	-$142,117	$12,000	$18,000	$48,000	$0	-$7,430
74	19	$0	$57,254	-$143,538	$12,000	$18,000	$48,000	$0	-$8,284
75	20	$0	$57,826	-$144,973	$12,000	$18,000	$48,000	$0	-$9,147
76	21	$0	$58,404	-$146,423	$12,000	$18,000	$48,000	$0	-$10,018
77	22	$0	$58,988	-$147,887	$12,000	$18,000	$48,000	$0	-$10,899
78	23	$0	$59,578	-$149,366	$12,000	$18,000	$48,000	$0	-$11,788
79	24	$0	$60,174	-$150,860	$12,000	$18,000	$48,000	$0	-$12,685
80	25	$0	$60,776	-$152,368	$12,000	$18,000	$48,000	$0	-$13,592
81	26	$0	$61,384	-$153,892	$12,000	$18,000	$48,000	$0	-$14,508
82	27	$0	$61,997	-$155,431	$12,000	$18,000	$48,000	$0	-$15,433
83	28	$0	$62,617	-$156,985	$12,000	$18,000	$48,000	$0	-$16,368
84	29	$0	$63,244	-$158,555	$12,000	$18,000	$48,000	$0	-$17,311
85	30	$0	$63,876	-$160,140	$12,000	$18,000	$48,000	$0	-$18,264

Appendix I- What if SSA is not available and Stew sells House F with a reduced lifestyle

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement draw	SSA	Cash flows
55	0	-$54,715							-$54,715
56	1	$10,268	$114,922	-$105,000	$0	$0	$0	$0	$20,190
57	2	$10,268	$115,401	-$106,050	$0	$0	$0	$0	$19,619
58	3	$10,268	$115,884	-$107,111	$0	$0	$0	$0	$19,042
59	4	$10,268	$116,372	-$108,182	$0	$0	$0	$0	$18,459
60	5	$10,268	$116,866	-$109,263	$0	$0	$0	$0	$17,870
61	6	$10,268	$117,364	-$110,356	$0	$0	$0	$0	$17,276
62	7	$0	$117,867	-$111,460	$12,000	$18,000	$48,000	$0	$84,407
63	8	$0	$51,318	-$112,574	$12,000	$18,000	$48,000	$0	$16,744
64	9	$0	$51,831	-$113,700	$12,000	$18,000	$48,000	$0	$16,131
65	10	$0	$52,349	-$114,837	$12,000	$18,000	$48,000	$0	$15,512
66	11	$0	$52,873	-$115,985	$12,000	$18,000	$48,000	$0	$14,887
67	12	$0	$53,401	-$117,145	$12,000	$18,000	$48,000	$0	$14,256
68	13	$0	$53,935	-$118,317	$12,000	$18,000	$48,000	$0	$13,619
69	14	$0	$54,475	-$119,500	$12,000	$18,000	$48,000	$0	$12,975
70	15	$0	$55,020	-$120,695	$12,000	$18,000	$48,000	$0	$12,325
71	16	$0	$55,570	-$121,902	$12,000	$18,000	$48,000	$0	$11,668
72	17	$0	$56,125	-$123,121	$12,000	$18,000	$48,000	$0	$11,005
73	18	$0	$56,687	-$124,352	$12,000	$18,000	$48,000	$0	$10,335
74	19	$0	$57,254	-$125,595	$12,000	$18,000	$48,000	$0	$9,658
75	20	$0	$57,826	-$126,851	$12,000	$18,000	$48,000	$0	$8,975
76	21	$0	$58,404	-$128,120	$12,000	$18,000	$48,000	$0	$8,284
77	22	$0	$58,988	-$129,401	$12,000	$18,000	$48,000	$0	$7,587
78	23	$0	$59,578	-$130,695	$12,000	$18,000	$48,000	$0	$6,883
79	24	$0	$60,174	-$132,002	$12,000	$18,000	$48,000	$0	$6,172
80	25	$0	$60,776	-$133,322	$12,000	$18,000	$48,000	$0	$5,454
81	26	$0	$61,384	-$134,655	$12,000	$18,000	$48,000	$0	$4,728
82	27	$0	$61,997	-$136,002	$12,000	$18,000	$48,000	$0	$3,996
83	28	$0	$62,617	-$137,362	$12,000	$18,000	$48,000	$0	$3,255
84	29	$0	$63,244	-$138,736	$12,000	$18,000	$48,000	$0	$2,508
85	30	$0	$63,876	-$140,123	$12,000	$18,000	$48,000	$0	$1,753

Appendix J- Stew incurs legal assistance at age 60 at a cost of $10,000

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement early draw	SSA	Legal Cost	Cash flows
55	0	-54715								-54715
56	1	10268	114922	-120000	0	0	0	0	0.00	5190
57	2	10268	115401	-121200	0	0	0	0	0.00	4469
58	3	10268	115884	-122412	0	0	0	0	0.00	3740
59	4	10268	116372	-123636	0	0	0	0	0.00	3004
60	**5**	**10268**	**116866**	**-124872**	**0**	**0**	**0**	**0**	**-10000**	**-7739**
61	6	10268	117364	-126121	0	0	0	0	0.00	1511
62	7	0	117867	-127382	12000	18000	48000	36000	0.00	104484
63	8	0	51318	-128656	12000	18000	48000	36000	0.00	36662
64	9	0	51831	-129943	12000	18000	48000	36000	0.00	35888
65	10	0	52349	-131242	12000	18000	48000	36000	0.00	35107
66	11	0	52873	-132555	12000	18000	48000	36000	0.00	34318
67	12	0	53401	-133880	12000	18000	48000	36000	0.00	33521
68	13	0	53935	-135219	12000	18000	48000	36000	0.00	32716
69	14	0	54475	-136571	12000	18000	48000	36000	0.00	31904
70	15	0	55020	-137937	12000	18000	48000	36000	0.00	31083
71	16	0	55570	-139316	12000	18000	48000	36000	0.00	30254
72	17	0	56125	-140709	12000	18000	48000	36000	0.00	29416
73	18	0	56687	-142117	12000	18000	48000	36000	0.00	28570
74	19	0	57254	-143538	12000	18000	48000	36000	0.00	27716
75	20	0	57826	-144973	12000	18000	48000	36000	0.00	26853
76	21	0	58404	-146423	12000	18000	48000	36000	0.00	25982
77	22	0	58988	-147887	12000	18000	48000	36000	0.00	25101
78	23	0	59578	-149366	12000	18000	48000	36000	0.00	24212
79	24	0	60174	-150860	12000	18000	48000	36000	0.00	23315
80	25	0	60776	-152368	12000	18000	48000	36000	0.00	22408
81	26	0	61384	-153892	12000	18000	48000	36000	0.00	21492
82	27	0	61997	-155431	12000	18000	48000	36000	0.00	20567
83	28	0	62617	-156985	12000	18000	48000	36000	0.00	19632
84	29	0	63244	-158555	12000	18000	48000	36000	0.00	18689
85	30	0	63876	-160140	12000	18000	48000	36000	0.00	17736

Appendix K- What if Stew incurs Medical emergency

Age	Year	Annuity Income	Income from Property	Lifestyle Mainatiance	IRA	401K	Retirement draw	SSA	Medical Cost	Cash flows
55	0	-$54,714.66								-$54,714.66
56	1	$10,268.20	$114,922.03	-$120,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,190.24
57	2	$10,268.20	$115,400.68	-$121,200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4,468.89
58	3	$10,268.20	$115,884.12	-$122,412.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,740.32
59	4	$10,268.20	$116,372.39	-$123,636.12	$0.00	$0.00	$0.00	$0.00	-$20,000.00	**-$16,995.53**
60	5	$10,268.20	$116,865.54	-$124,872.48	$0.00	$0.00	$0.00	$0.00	-$30,000.00	**-$27,738.73**
61	6	$10,268.20	$117,363.63	-$126,121.21	$0.00	$0.00	$0.00	$0.00	-$35,000.00	**-$33,489.37**
62	7	$0.00	$117,866.69	-$127,382.42	$12,000.00	$18,000.00	$48,000.00	$36,000.00	-$40,000.00	**$64,484.28**
63	8	$0.00	$51,317.76	-$128,656.24	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$36,661.52
64	9	$0.00	$51,830.94	-$129,942.80	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$35,888.13
65	10	$0.00	$52,349.25	-$131,242.23	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$35,107.01
66	11	$0.00	$52,872.74	-$132,554.66	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$34,318.08
67	12	$0.00	$53,401.47	-$133,880.20	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$33,521.26
68	13	$0.00	$53,935.48	-$135,219.00	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$32,716.48
69	14	$0.00	$54,474.83	-$136,571.19	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$31,903.64
70	15	$0.00	$55,019.58	-$137,936.91	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$31,082.68
71	16	$0.00	$55,569.78	-$139,316.27	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$30,253.50
72	17	$0.00	$56,125.48	-$140,709.44	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$29,416.04
73	18	$0.00	$56,686.73	-$142,116.53	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$28,570.20
74	19	$0.00	$57,253.60	-$143,537.70	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$27,715.90
75	20	$0.00	$57,826.13	-$144,973.07	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$26,853.06
76	21	$0.00	$58,404.40	-$146,422.80	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$25,981.59
77	22	$0.00	$58,988.44	-$147,887.03	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$25,101.41
78	23	$0.00	$59,578.32	-$149,365.90	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$24,212.42
79	24	$0.00	$60,174.11	-$150,859.56	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$23,314.55
80	25	$0.00	$60,775.85	-$152,368.16	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$22,407.69
81	26	$0.00	$61,383.61	-$153,891.84	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$21,491.77
82	27	$0.00	$61,997.44	-$155,430.76	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$20,566.69
83	28	$0.00	$62,617.42	-$156,985.07	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$19,632.35
84	29	$0.00	$63,243.59	-$158,554.92	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$18,688.68
85	30	$0.00	$63,876.03	-$160,140.47	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$17,735.56

Appendix L- Stew sells all houses and keep the money in the Annuity

Age	Year	Annuity Income	Rental income	Lifestyle Mainatiance	IRA	401K	Retirement draw	SSA	Medical Cost	Income from Selling the house	Cash flows
55	0	-$54,714.66									-$54,714.66
56	1	$10,268.20	$114,922.03	-$120,000.00	$0.00	$0.00	$0.00	$0.00	$0.00		$5,190.24
57	2	$10,268.20	$115,400.68	-$121,200.00	$0.00	$0.00	$0.00	$0.00	$0.00		$4,468.89
58	3	$10,268.20	$115,884.12	-$122,412.00	$0.00	$0.00	$0.00	$0.00	$0.00		$3,740.32
59	4	$10,268.20	$110,190.58	-$123,636.12	$0.00	$0.00	$0.00	$0.00	-$25,000.00	$45,271.64	**$17,094.30**
60	5	$10,268.20	$110,621.92	-$124,872.48	$0.00	$0.00	$0.00	$0.00	-$25,000.00	$45,271.64	**$16,289.28**
61	6	$10,268.20	$111,057.57	-$126,121.21	$0.00	$0.00	$0.00	$0.00	-$25,000.00	$45,271.64	**$15,476.20**
62	7	$0.00	$111,497.57	-$127,382.42	$12,000.00	$18,000.00	$48,000.00	$36,000.00	-$30,000.00	$45,271.64	$113,386.79
63	8	$0.00	$44,884.95	-$128,656.24	$12,000.00	$18,000.00	$48,000.00	$36,000.00	-$30,000.00	$45,271.64	$45,500.34
64	9	$0.00	$45,333.80	-$129,942.80	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$29,390.99
65	10	$0.00	$45,787.13	-$131,242.23	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$28,544.90
66	11	$0.00	$46,245.01	-$132,554.66	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$27,690.35
67	12	$0.00	$46,707.46	-$133,880.20	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$26,827.25
68	13	$0.00	$47,174.53	-$135,219.00	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$25,955.53
69	14	$0.00	$47,646.28	-$136,571.19	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$25,075.08
70	15	$0.00	$48,122.74	-$137,936.91	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$24,185.83
71	16	$0.00	$48,603.97	-$139,316.27	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$23,287.69
72	17	$0.00	$49,090.00	-$140,709.44	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$22,380.57
73	18	$0.00	$49,580.91	-$142,116.53	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$21,464.37
74	19	$0.00	$50,076.71	-$143,537.70	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$20,539.02
75	20	$0.00	$50,577.48	-$144,973.07	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$19,604.41
76	21	$0.00	$51,083.26	-$146,422.80	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$18,660.45
77	22	$0.00	$51,594.09	-$147,887.03	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$17,707.06
78	23	$0.00	$52,110.03	-$149,365.90	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$16,744.13
79	24	$0.00	$52,631.13	-$150,859.56	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$15,771.57
80	25	$0.00	$53,157.44	-$152,368.16	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$14,789.28
81	26	$0.00	$53,689.02	-$153,891.84	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$13,797.18
82	27	$0.00	$54,225.91	-$155,430.76	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$12,795.15
83	28	$0.00	$54,768.16	-$156,985.07	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$11,783.10
84	29	$0.00	$55,315.85	-$158,554.92	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$10,760.93
85	30	$0.00	$55,869.00	-$160,140.47	$12,000.00	$18,000.00	$48,000.00	$36,000.00	$0.00	$0.00	$9,728.54

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